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IS 11445 (1985): Parallax bar [PGD 22: Educational Instruments and Equipment]



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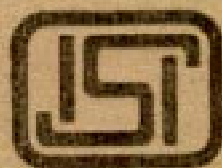


IS : 11445 - 1985

*Indian Standard*

SPECIFICATION FOR  
PARALLAX BAR ( STEREOMETER )

UDC 531.719.24



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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## SPECIFICATION FOR

### PARALLAX BAR ( STEREOMETER )

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# *Indian Standard*

## SPECIFICATION FOR PARALLAX BAR ( STEREOMETER )

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 23 August 1985, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Mechanical Division Council.

**0.2** The parallax bar also known as stereometer is a handy instrument used for making measurements of horizontal parallaxes between two points in a stereo-pair which can be converted to height-difference. Knowing the height of one point ( that is, reference point ), heights of various points in the stereomodel can be determined.

**0.3** The parallax bar consists of two parts, one fixed and the other movable. Each part carries a removable graticule plate provided with any or all of the three types of stereomarks, namely a dot, a circle or cross. The fixed part is provided with graduations in millimetres. The drum attached with the fixed part of instrument is provided with micro-metre divisions having a least count of 0.01 mm. The fixed part carries an inner rod on which the movable part slides. The two graticule plates are inserted in the metallic mounts of movable and fixed parts.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard covers the general and functional requirements of parallax bar ( stereometer ).

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\*Rules for rounding off numerical values ( revised ).

## **2. TERMINOLOGY**

**2.0** For the purpose of this standard, the following definitions shall apply.

**2.1 Floating Marks** — The similar pair of marks on the two graticule plates, when viewed through stereoscope, merge into a single mark which is called floating mark.

**2.2 Parallax** — Stereoscopic parallax is the change in position of image of a point due to change in the position of the camera.

**2.3 Horizontal Parallax** — During stereoscopic viewing, under coincidence condition, when stereomarks on the graticule plate of a parallax are set to identical points on the two photographs, the distance between these points in the direction of the base is called horizontal parallax.

## **3. GENERAL REQUIREMENTS**

**3.1** The two parts ( fixed and movable ) of the instrument shall be made of aluminium alloy, brass or steel ( *see* Fig. 1 ) of good quality, free from flaws and defects.

**3.2** The aluminium shall be anodized and given any light colour. The brass shall be chrome-plated and steel part shall be given any light colour.

**3.3** The cover of the fixed part shall carry markings of linear scale in mm which shall be engraved. The rod of fixed part shall be provided with an index line for use with linear scale.

**3.4** The micrometer drum, carrying the engraved markings, shall be fitted with one end of fixed part which shall have an index line for use with micrometer.

**3.5** All the markings shall be engraved up to proper depth. The markings shall be neat and well defined and shall have adequate contrast with the background.

**3.6** Proper knurling shall be provided on the micrometer knob for ease of holding.

**3.7** The screw for locking the movable part on fixed part shall be chrome-plated and shall have close fit. It shall flush with outer surface of movable part to give proper look.

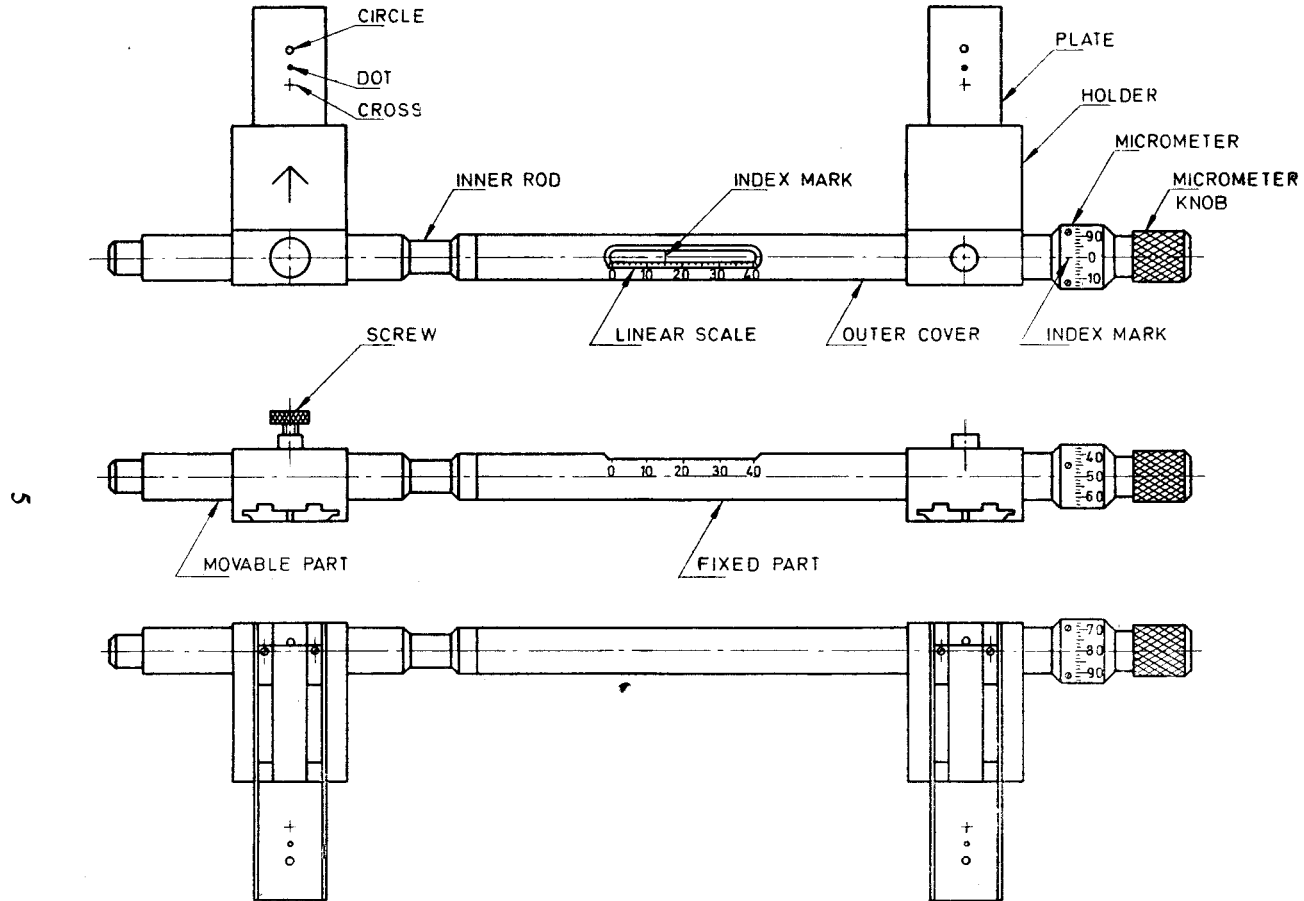


FIG. 1 PARALLAX BAR

**3.8** The graticule plates shall be made of hard sheet glass or plastic and shall be reasonably free from bubbles, scratches, etc. These shall be transparent and colourless.

**3.9** The graticule plates shall be well fitted in their holders, one connected with fixed part and the other connected with movable part. The fittings shall be such that these rest with pressure against their pins. The lower surface of plates shall be in the same level so that they may rest on the stereo-pair simultaneously.

**3.10** The lengths of the open position of the two graticule plates shall be equal.

**3.11** The upper and lower surface of the graticule plates shall be optically flat, having parallelism within one minute.

**3.12** The dimensions of the graticule plates shall be equal within a tolerance of  $\pm 0.1$  mm. The thickness shall be of the order of 3.0 mm. The two graticule plates shall be mutually interchangeable.

**3.13** The lower surface of open portion of graticule plates shall carry three engraved or photoetched marks, namely, a circle, a dot and cross duly filled in black. The marks shall be well defined having adequate contrast with the background.

**3.14** The distance between the marks on the two graticule plates shall be the same.

**3.15** The workmanship and finish of the instrument shall be of best quality.

**3.16** The instrument shall be provided with a suitable wooden or plastic case duly fitted with cushioning material and carrying handle. The base lining of the case shall be firmly secured. When placed inside the case, the instrument shall not rattle.

**3.17** The following accessories shall be provided with each parallax bar :

- a) Spare graticule plates — 2 No.
- b) Micrometer adjusting spanner — 1 No.
- c) Dusting brush — 1 No.
- d) Chamois leather — 1 No.
- e) Suitable tommy pin — 1 No.

## 4. FUNCTIONAL REQUIREMENTS

4.1 The parallax bar shall meet the following technical requirements:

a)	Measuring range of linear scale ( lines engraved at each mm and figured at every 10 mm )	0.40 mm
	Length of mm marks	1.5 mm
	Length of cm and 5 mm marks	2.5 mm
	Thickness of lines	0.1 mm
b)	Divisions on micrometer drum ( all lines engraved and figured at steps of 10 )	100
	Length of 0,10 ... 90 figured lines =	4.0 mm
	Length of 5,15 ..... 95 figured lines =	3.0 mm
	Length of other lines	2.0 mm
	Thickness of lines	0.1 mm
c)	Least count of micrometer	0.01 mm
d)	Minimum separation between two plates	85 mm
e)	Maximum separation between two plates	260 mm
f)	Outer diameter of the circle marks on graticule plates	0.5 mm
g)	Diameter of the dot marks on graticule plates	0.2 mm
h)	Length of the two cross lines on graticule plates	1.0 mm
j)	Thickness of cross lines and circle line	0.1 mm

4.2 The movement of the micrometer shall be correct, easy and smooth and shall actuate the movement of outer cover of fixed part carrying right hand graticule plate. The movement shall be free from backlash. The position once set shall not shift on its own accord.

4.3 The movement of the cover of fixed part and of movable part over the rod shall be easy and smooth without any shake and looseness. The position once set shall not shift on its own accord.

4.4 The graticule markings, when viewed under a magnification of 6X, shall appear sharply defined, identical in shape, undistorted and of uniform thickness.

4.5 The line joining the similar marks on the two graticule plates shall be parallel to the horizontal axis of the instrument throughout all separations between the fixed and movable plates. The deviation in parallelism shall be within 0.01 mm.

4.6 The instrument shall be able to withstand field conditions.

## 5. TESTS

5.1 The parallax bar shall be tested for the various requirements laid down under 3 and 4.

5.2 The parallax bar shall be checked visually for the following defects:

- a) Missing, loose or damaged components,
- b) Finish of the various parts,
- c) Engravings and markings on scales, and
- d) Etchings/engravings on graticule plates.

5.3 When compared against a certified metal scale at 27°C, tolerance on the various graduations of the linear scale shall not exceed the following limits:

- a) Between any two scale marks or continuous centimetre scale marks  $\pm 0.02$  mm
- b) Between any two scale marks, more than one centimetre apart up to and including full length of the scale  $\pm 0.05$  mm

5.4 The instrument shall be used to determine the parallax of a point in the stereopair ten times. The deviation of readings from the mean shall not be more than  $\pm 0.02$  mm.

5.5 Type Approval Tests — If agreed to between the manufacturer and the purchaser the following tests shall be carried on.

5.5.1 The 5 percent samples of instrument shall be subjected to the following climatic tests as per the details given in the relevant specifications shown below:

- a) *Dry heat test* :  $+ 55 \pm 3^\circ\text{C}$  for 3 hours  
[ IS : 10236 ( Part 2 ) - 1982\* ]
- b) *Cold test* :  $- 20 \pm 3^\circ\text{C}$  for 3 hours  
[ IS : 10236 ( Part 3 ) - 1982† ]

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\*Procedure for basic climatic and durability tests for optical instruments: Part 2  
Dry heat test.

†Procedure for basic climatic and durability tests for optical instruments: Part 3  
Cold test.

- c) *Drop test* : The instrument, in its case, shall be dropped from a height of 15 cm on a sand bed. The sand bed shall be a layer of 15 cm thick ordinary sand covered with a piece of canvas. The test shall be repeated three times.

[ IS : 10236 ( Part 15 ) \* ]

After each test the performance of the instrument shall be checked and ascertained.

## 6. MARKING

6.1 The instrument shall be marked with the manufacturer's name or trade-mark and the year of manufacture.

6.1.1 The instrument may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by provisions of the Indian Standards Institution ( Certification Mark ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a welldefined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity with that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

## 7. PACKING

7.1 The instrument shall be placed in its case and suitably packed for transit.

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\*Procedure for basic climatic and durability tests for optical instruments: Part 15 Drop test ( *under preparation* ).